Tables

Table 1
Constituents by Manufacturing Area
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site
Montague, Michigan

Historic Process Chemicals	Use if known	Properties and Environmental Fate	Potential for Vapor Issue
Acetylene-Neoprene Process			
Fuel oil – carbon	raw material for arc-acetylene unit	liquid hydrocarbon; expected to bio degrade slowly in the presence of oxygen	Unlikely
Calcium carbide	raw material for carbide acetylene unit	solid, reacts with moisture to form acetylene and hydrated lime; very unlikely to persist	None
DMF (dimethylformamide)	stabilizer for acetylene	semivolatile liquid (boiling point 300 to 313 °F), completely soluble in water, expected to have flushed out and follow an aerobic degradation pathway https://pubchem.ncbi.nlm.nih.gov/compound/6228	None
Acetone	stabilizer for acetylene; has been sampled at the site in the past	volatile liquid, water soluble, expected to bio degrade aerobically	**Yes**
Acetylene	intermediate product	highly reactive hydrocarbon gas, very unlikely to persist	Unlikely to be present
Thiocyanate	unconfirmed; believed to be a by-product of acetylene reaction when present with nitrogen	solid, dissolves in water	None
Acetaldehyde	unconfirmed use; has been sampled at the site in the past	flammable liquid/gas (boiling point 69 °F), water soluble, aeroic degradation pathway	Unlikely to be present
Butyl carbitol (Diethylene glycol monoethyl ether) (DMGE)	unconfirmed use	liquid, very soluble in water, oxidizes in air	Unlikely
MVA (monovinylacetylene)	intermediate product, raw material for chloroprene	extremely flammable/explosive gas, very unlikely to persist (https://pubchem.ncbi.nlm.nih.gov/compound/12720#section=Identification)	Unlikely
DVA (divinylacetylene)	by-product of MVA	flammable and highly reactive liquid, will volatilize to air or self polymerize, very unlikely to persist (https://pubchem.ncbi.nlm.nih.gov/compound/61222)	Unlikely
Chloroprene (chloro-2-butadiene-1,3)	intermediate product for making neoprene;	highly reactive, will volatilize to air or self polymerize, very unlikely to persist	Unlikely
Neoprene (polychloroprene)	final commercial product	solid material, inert and insoluble	None
Cuprous chloride	catalyst for MVA and chloroprene	solid, highly soluble in water, will oxidize to an insoluble hydroxide	None
Ammonium chloride	catalyst for MVA and chloroprene	solid, highly soluble in water, will flush out over time	None
Potassium chloride	catalyst for MVA and chloroprene	solid, highly soluble in water, will flush out over time	None
Hydrochloric acid (HCl)	raw material for chloroprene	gas, highly soluble in water, will flush out and react with soil to neutralize	None
Caustic	(neutralizing residual HCl in chloroprene)	solid, highly soluble in water, will flush out over time	None

Notes:

DMGE is considered unlikely to pose a vapor potential because the chemical would tend to "remain dissolved in water and may be transported in the water column due to their high solubility in water and low organic carbon partition coefficient. They have a relatively low Henry's Law constant". *Reassessment of 3 Tolerance Exemptions for Ethylene Glycol, Diethylene Glycol, and the Combination of DGME, DGEE, and DGBE*. USEPA. Part 5. June 2006. https://www.epa.gov/sites/default/files/2015-04/documents/glycolethers.pdf.

Table 1
Constituents by Manufacturing Area
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site
Montague, Michigan

Historic Process Chemicals	Use if known	Properties and Environmental Fate	Potential for Vapor Issue
Freon Process			
Hydrofluoric acid (HF)	raw material	Very reactive gas, will neutralize in soil to fluoride salts	None
Tetrachloroethene (PCE)	raw material	volatile liquid, heavier than water, persists in groundwater unless reducing conditions	**Yes**
Carbon tetrachloride	raw material	similar to PCE	**Yes**
Chloroform	raw material	similar to PCE	**Yes**
Trichlorofluoromethane (CFC-11)	final commercial product	refrigerant gas, persists in environment	**Yes**
Dichlorodifluoromethane (CFC-12)	final commercial product	refrigerant gas, persists in environment	**Yes**
Chlorotrifluoromethane (CFC-13)	final commercial product	refrigerant gas for low-temperature systems, persists in environment	**Yes**
Chlorodifluoromethane (CFC-22)	final commercial product	refrigerant gas, early alternative product to replace CFC-12, persists in environment	**Yes**
1,1,2-Trichlorotrifluoroethane (CFC-113)	final commercial product	liquid solvent, similar physical characteristics as carbon tetrachloride, persists in environment	**Yes**
Fluoride (ion)	by-product (excess from process)	will bind with calcium to form low solubility CaF2	None
Hydrochloric acid (HCl)	by-product from fluorination of chlorocarbons	gas, highly soluble in water, will flush out and react with soil to neutralize	None
Antimony chloride	catalyst	solid, soluble in water as a chloride but will oxidize to an insoluble hydroxide	None
Caustic (sodium hydroxide)	pH adjustment of process water	solid, highly soluble in water, will flush out over time	None

Notes:

The site on-going monitoring program has reported the following VOCs: carbon tetrachloride; chloroform; TCE; PCE; Freon 113; trichlorofluoromethane, dichlorodifluoromethane. The two missing VOCs are CFC-13 and CFC-22. These should be added to the VIAP sampling if possible.

Table 2
WMUs and AOCs
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site
Montague, Michigan

WMU/AOC[1]	Site Investigation		VIAP Potential	
	No Further Investigation	Reports documenting data		
Northeast Landfill	✓	2012 Investigation Report		
North Landfill	✓	2012 Investigation Report		
Bury Pit Landfill	✓	2014 Addendum No. 3		
Pierson Creek Landfill	✓	2014 Addendum No. 2		
Pierson Creek	✓	2017 Annual Report[2]	✓	
Former Basin Sludge Storage Area	✓	2014 Addendum No. 1		
Waste Neoprene Landfill	✓	2014 Addendum No. 1		
Lime Pile	✓	2006 Prioritization Report		
Mirror Lake	✓	2012 Investigation Report		
Calcium Fluoride Basin	✓	2006 Prioritization Report		
Railcar Unloading Area East	✓	2012 Investigation Report		
Railcar Unloading Area West	✓	2012 Investigation Report		
Former HCl Storage Tanks	✓	2012 Investigation Report		
HCl Injection Well	✓	2006 Prioritization Report		
Former NPDES Surface Impoundment/Wastewater Dit	✓	2012 Investigation Report		
Condensate Accumulation Area	✓	2006 Prioritization Report		
Groundwater plume from Former Manufacturing Area (interceptor well system operating)	✓	2012 Investigation Report and groundwater monitoring reports.	✓	

Notes:

✓: Proposed path forward is denoted with a checkmark.

2006 Prioritization Report:	*Prioritization of Waste Management Units and Areas of Concern. November 2006*
2012 RI Report:	*Draft 2010/2011 Remedial Investigation Report.* June 29, 2012.
2014 Addendum No. 1	*Remedial Investigation Report - Addendum No. 1 Supplemental Investigation – Former Waste Neoprene Landfill and Former Basin Sludge Storage Area.* March 19, 2014.
2014 Addendum No. 2	*Remedial Investigation Report - Addendum No. 2 Supplemental Investigation – Pierson Creek Landfill Area*. May 16, 2014.
2014 Addendum No. 3	*Remedial Investigation Report - Addendum No. 3 Supplemental Investigation – Bury Pit Landfill*. May 30, 2014.
2017 Annual Report	*2017 Groundwater Monitoring Results*. March 9, 2018.

[1]: Note that the site has not used an ID system to differentiate WMUs (units in which wastes were handled) or AOCs (areas in which site-related constituents have been found).

[2]: Had been asked by MDEQ to demonstrate that PCL-007 well has not been compromised.

Table 3
Occurrence, Distribution, and Selection of Constituents of Interest (Vapor Intrusion – Groundwater, Industrial Exposure)
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site, Montague, Michigan

Constituents	CASRN	Total Samples	Total Detections	FOD	Units	Range of Detections	Location of Maximum Detection	Range of Reporting Limits	Screening Concentration		Screening Level [1, 2]	COPC?	Rationale
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	71-55-6	278	26	9%	µg/L	0.3 – 7	MW-224-060 (5/11/2010)	1 – 13	7	MDC	110000	No	RL and MDC ≤ EGLE SL
1,1,2-Trichloroethane	79-00-5	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	110	No	100% ND and RL ≤ EGLE SL
1,1,2-Trichlorotrifluoroethane	76-13-1	278	170	61%	µg/L	2 – 190	MW-302-130 (11/4/2010)	10 – 25	190	MDC	37000	No	RL and MDC ≤ EGLE SL
1,1-Dichloroethane	75-34-3	278	27	10%	µg/L	0.3 – 8	MW-224-060 (5/11/2010)	1 – 13	8	MDC	1500	No	RL and MDC ≤ EGLE SL
1,1-Dichloroethene	75-35-4	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	2300	No	100% ND and RL ≤ EGLE SL
1,2-Dichlorobenzene	95-50-1	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	100000	No	100% ND and RL ≤ EGLE SL
1,2-Dichloroethane	107-06-2	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	450	No	100% ND and RL ≤ EGLE SL
1,2-Dichloropropane	78-87-5	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	580	No	100% ND and RL ≤ EGLE SL
1,3-Dichlorobenzene	541-73-1	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	720	No	100% ND and RL ≤ EGLE SL
1,4-Dichlorobenzene	106-46-7	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	2600	No	100% ND and RL ≤ EGLE SL
Acetaldehyde	75-07-0	5	0	0%	µg/L	N/A	N/A	60 – 60	60	RL	27000	No	100% ND and RL ≤ EGLE SL
Acetone	67-64-1	6	0	0%	µg/L	N/A	N/A	20 – 20	20	RL	140000000	No	100% ND and RL ≤ EGLE SL
Acrylonitrile	107-13-1	6	0	0%	µg/L	N/A	N/A	20 – 20	20	RL	1200	No	100% ND and RL ≤ EGLE SL
Benzene	71-43-2	278	30	11%	µg/L	0.2 – 17	MW-224-060 (6/7/2017)	1 – 13	17	MDC	310	No	RL and MDC ≤ EGLE SL
Carbon Tetrachloride	56-23-5	278	56	20%	µg/L	0.3 – 35	MW-206-040 (5/11/2010)	1 – 13	35	MDC	120	No	RL and MDC ≤ EGLE SL
Chlorobenzene	108-90-7	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	7400	No	100% ND and RL ≤ EGLE SL
Chloroform	67-66-3	278	75	27%	µg/L	0.3 – 8	MW-206-040 (5/3/2012)	1 – 13	8	MDC	170	No	RL and MDC ≤ EGLE SL
Chloroprene	126-99-8	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	No SL	No	100% ND and RL ≤ EGLE SL
cis-1,2 Dichloroethene	156-59-2	278	75	27%	µg/L	0.7 – 150	MW-304-123 (5/12/2010)	1 – 13	150	MDC	650	No	RL and MDC ≤ EGLE SL
cis-1,3-Dichloropropene	10061-01-5	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1100	No	100% ND and RL ≤ EGLE SL
Dichlorodifluoromethane	75-71-8	278	4	1%	µg/L	0.5 – 3	MW-302-130 (11/4/2010)	1 – 13	3	MDC	390	No	RL and MDC ≤ EGLE SL
Ethyl Chloride	75-00-3	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	90000	No	100% ND and RL ≤ EGLE SL
Ethylbenzene	100-41-4	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	980	No	100% ND and RL ≤ EGLE SL
Methyl Chloride	74-87-3	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	2100	No	100% ND and RL ≤ EGLE SL
Methyl Methacrylate	80-62-6	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	No SL	No	100% ND and RL ≤ EGLE SL
Methylene Chloride	75-09-2	278	7	3%	µg/L	0.8 – 0.9	Multiple Locations	1 – 13	0.9	MDC	53000	No	RL and MDC ≤ EGLE SL
Styrene	100-42-5	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	12000	No	100% ND and RL ≤ EGLE SL
Tetrachloroethene	127-18-4	276	207	75%	µg/L	0.6 – 720	MW-229-125 (11/3/2010)	1 – 50	720	MDC	900	No	RL and MDC ≤ EGLE SL
Tetrahydrofuran	109-99-9	6	1	17%	µg/L	8 – 8	MW-209-067 (10/12/2010)	10 – 10	8	MDC	7700000	No	RL and MDC ≤ EGLE SL
Toluene	108-88-3	276	45	16%	µg/L	0.3 – 3200	MW-224-060 (6/7/2017)	1 – 130	3200	MDC	300000	No	RL and MDC ≤ EGLE SL
trans-1,2-Dichloroethene	156-60-5	276	26	9%	µg/L	0.3 – 16	MW-206-040 (5/24/2018)	1 – 13	16	MDC	2700	No	RL and MDC ≤ EGLE SL
trans-1,3-Dichloropropene	10061-02-6	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1100	No	100% ND and RL ≤ EGLE SL
Trichloroethene	79-01-6	276	101	37%	µg/L	0.2 – 53	MW-302-130 (5/12/2010)	1 – 13	53	MDC	57	No	RL and MDC ≤ EGLE SL
Trichlorofluoromethane	75-69-4	276	11	4%	µg/L	0.4 – 6	MW-304-123 (5/12/2010)	1 – 13	6	MDC	1600	No	RL and MDC ≤ EGLE SL
Vinyl Chloride	75-01-4	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	73	No	100% ND and RL ≤ EGLE SL
Xylenes	1330-20-7	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	16000	No	100% ND and RL ≤ EGLE SL
Other Volatile Constituents													
1,2,4-Trichlorobenzene	120-82-1	6	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1400	No	100% ND and RL ≤ EGLE SL
2-Chlorophenol	95-57-8	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	430000	No	100% ND and RL ≤ EGLE SL
2-Methylnaphthalene	91-57-6	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	19000	No	100% ND and RL ≤ EGLE SL
Acenaphthene	83-32-9	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	3900	No	100% ND and RL ≤ EGLE SL
Acenaphthylene	208-96-8	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	490	No	100% ND and RL ≤ EGLE SL
Acetophenone	98-86-2	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	6100000	No	100% ND and RL ≤ EGLE SL
Ammonia	7664-41-7	5	5	100%	µg/L	69 – 540	MW-250-054 (10/13/2010)	150 – 150	540	MDC	5600000	No	RL and MDC ≤ EGLE SL
Anthracene	120-12-7	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	43	No	100% ND and RL ≤ EGLE SL
Benzo(a)anthracene	56-55-3	5	0	0%	µg/L	N/A	N/A	0.05 – 0.055	0.055	RL	9.4	No	100% ND and RL ≤ EGLE SL
Benzo(g,h,i)perylene	191-24-2	5	1	20%	µg/L	0.014 – 0.014	MW-250-054 (10/13/2010)	0.05 – 0.055	0.014	MDC	No SL	No	RL and MDC ≤ EGLE SL
Cyanide	57-12-5	5	0	0%	µg/L	N/A	N/A	10 – 10	10	RL	No SL	No	100% ND and RL ≤ EGLE SL

Table 3
Occurrence, Distribution, and Selection of Constituents of Interest (Vapor Intrusion – Groundwater, Industrial Exposure)
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site, Montague, Michigan

Constituents	CASRN	Total Samples	Total Detections	FOD	Units	Range of Detections	Location of Maximum Detection	Range of Reporting Limits	Screening Concentration		Screening Level (1, 2)	COPC?	Rationale
Dibenzofuran	132-64-9	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	3100	No	100% ND and RL ≤ EGLE SL
Fluorene	86-73-7	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1700	No	100% ND and RL ≤ EGLE SL
Hexachlorobenzene	118-74-1	5	0	0%	µg/L	N/A	N/A	0.05 – 0.055	0.055	RL	6.2	No	100% ND and RL ≤ EGLE SL
Hexachlorobutadiene	87-68-3	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	230	No	100% ND and RL ≤ EGLE SL
Hexachloroethane	67-72-1	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1000	No	100% ND and RL ≤ EGLE SL
Mercury	7439-97-6	6	0	0%	µg/L	N/A	N/A	0.2 – 0.2	0.2	RL	20	No	100% ND and RL ≤ EGLE SL
Naphthalene	91-20-3	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1700	No	100% ND and RL ≤ EGLE SL
Nitrobenzene	98-95-3	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	20000	No	100% ND and RL ≤ EGLE SL
N-Nitrosodimethylamine	62-75-9	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	No SL	No	100% ND and RL ≤ EGLE SL
Phenanthrene	85-01-8	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1200	No	100% ND and RL ≤ EGLE SL
Pyrene	129-00-0	5	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	140	No	100% ND and RL ≤ EGLE SL
Thiocyanate	463-56-9	6	1	17%	µg/L	660 – 660	MW-104-045 (5/31/2019)	100 – 100	660	MDC	No SL	No	RL and MDC ≤ EGLE SL

Notes:

% = Percent
CASRN = Chemical Abstracts Service Registry Number
COPC = Constituent of Potential Concern
FOD = Frequency of Detection
MDC = Maximum Detected Concentration
ND = Non-Detect or Not Detected
RL = Reporting Limit
SL = Screening Level
µg/L = micrograms per liter
(1) Site-specific groundwater volatilization to indoor air inhalation criteria (GVIIC) were provided by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) in a correspondence dated July 31, 2020.

Table 4
Occurrence, Distribution, and Selection of Constituents of Interest (Vapor Intrusion – Groundwater, Residential Exposure)
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site, Montague, Michigan

Constituents	CASRN	Total Samples	Total Detections	FOD	Units	Range of Detections	Location of Maximum Detection	Range of Reporting Limits	Screening Concentration		Screening Level [1, 2]	COPC?	Rationale
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	71-55-6	368	91	25%	µg/L	0.9 – 5	Multiple Locations	1 – 25	5	MDC	9600	No	RL and MDC ≤ EGLE SL
1,1,2-Trichloroethane	79-00-5	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	9	No	100% ND and RL ≤ EGLE SL
1,1,2-Trichlorotrifluoroethane	76-13-1	368	141	38%	µg/L	2 – 2800	MW-301-125 (5/12/2010)	10 – 250	2800	MDC	3000	No	RL and MDC ≤ EGLE SL
1,1-Dichloroethane	75-34-3	368	16	4%	µg/L	1 – 2	Multiple Locations	1 – 25	2	MDC	74	No	RL and MDC ≤ EGLE SL
1,1-Dichloroethene	75-35-4	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	190	No	100% ND and RL ≤ EGLE SL
1,2-Dichlorobenzene	95-50-1	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	8200	No	100% ND and RL ≤ EGLE SL
1,2-Dichloroethane	107-06-2	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	23	No	100% ND and RL ≤ EGLE SL
1,2-Dichloropropane	78-87-5	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	47	No	100% ND and RL ≤ EGLE SL
1,3-Dichlorobenzene	541-73-1	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	58	No	100% ND and RL ≤ EGLE SL
1,4-Dichlorobenzene	106-46-7	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	130	No	100% ND and RL ≤ EGLE SL
Acetaldehyde	75-07-0	1	0	0%	µg/L	N/A	N/A	60 – 60	60	RL	2000	No	100% ND and RL ≤ EGLE SL
Acetone	67-64-1	1	0	0%	µg/L	N/A	N/A	20 – 20	20	RL	14000000	No	100% ND and RL ≤ EGLE SL
Acrylonitrile	107-13-1	1	0	0%	µg/L	N/A	N/A	20 – 20	20	RL	56	No	100% ND and RL ≤ EGLE SL
Benzene	71-43-2	368	20	5%	µg/L	1 – 2	Multiple Locations	1 – 25	2	MDC	16	No	MDC ≤ EGLE SL < RL
Carbon Tetrachloride	56-23-5	368	115	31%	µg/L	0.9 – 220	Multiple Locations	1 – 25	220	MDC	6	Yes	MDC > EGLE SL
Chlorobenzene	108-90-7	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	600	No	100% ND and RL ≤ EGLE SL
Chloroform	67-66-3	368	104	28%	µg/L	0.6 – 26	Multiple Locations	1 – 25	26	MDC	8.4	Yes	MDC > EGLE SL
Chloroprene	126-99-8	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	No SL	No	100% ND and RL ≤ EGLE SL
cis-1,2 Dichloroethene	156-59-2	368	18	5%	µg/L	1 – 3	Multiple Locations	1 – 25	3	MDC	53	No	RL and MDC ≤ EGLE SL
cis-1,3-Dichloropropene	10061-01-5	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	58	No	100% ND and RL ≤ EGLE SL
Dichlorodifluoromethane	75-71-8	368	21	6%	µg/L	0.6 – 57	MW-WLP-003-080 (10/22/2019)	1 – 25	57	MDC	32	Yes	MDC > EGLE SL
Ethyl Chloride	75-00-3	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	7400	No	100% ND and RL ≤ EGLE SL
Ethylbenzene	100-41-4	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	50	No	100% ND and RL ≤ EGLE SL
Methyl Chloride	74-87-3	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	170	No	100% ND and RL ≤ EGLE SL
Methyl Methacrylate	80-62-6	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	No SL	No	100% ND and RL ≤ EGLE SL
Methylene Chloride	75-09-2	368	4	1%	µg/L	0.5 – 1	Multiple Locations	1 – 25	1	MDC	4300	No	RL and MDC ≤ EGLE SL
Styrene	100-42-5	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	620	No	100% ND and RL ≤ EGLE SL
Tetrachloroethene	127-18-4	368	173	47%	µg/L	0.6 – 3500	MW-WLP-001-125 (5/11/2010)	1 – 250	3500	MDC	110	Yes	MDC > EGLE SL
Tetrahydrofuran	109-99-9	1	0	0%	µg/L	N/A	N/A	10 – 10	10	RL	560000	No	100% ND and RL ≤ EGLE SL
Toluene	108-88-3	368	29	8%	µg/L	0.5 – 8	Multiple Locations	1 – 25	8	MDC	25000	No	RL and MDC ≤ EGLE SL
trans-1,2-Dichloroethene	156-60-5	368	2	1%	µg/L	0.7 – 3	MW-LSD-001-080 (8/26/2014)	1 – 25	3	MDC	220	No	RL and MDC ≤ EGLE SL
trans-1,3-Dichloropropene	10061-02-6	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	58	No	100% ND and RL ≤ EGLE SL
Trichloroethene	79-01-6	368	58	16%	µg/L	0.3 – 5	Multiple Locations	1 – 25	5	MDC	6.8	No	MDC ≤ EGLE SL < RL
Trichlorofluoromethane	75-69-4	368	7	2%	µg/L	0.6 – 3	MW-214-060 (5/12/2010)	1 – 25	3	MDC	130	No	RL and MDC ≤ EGLE SL
Vinyl Chloride	75-01-4	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1	Yes	100% ND and RL > EGLE SL
Xylenes	1330-20-7	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1300	No	100% ND and RL ≤ EGLE SL
Other Volatile Constituents													
1,2,4-Trichlorobenzene	120-82-1	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	110	No	100% ND and RL ≤ EGLE SL
2-Chlorophenol	95-57-8	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	37000	No	100% ND and RL ≤ EGLE SL
2-Methylnaphthalene	91-57-6	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1400	No	100% ND and RL ≤ EGLE SL
Acenaphthene	83-32-9	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	3900	No	100% ND and RL ≤ EGLE SL
Acenaphthylene	208-96-8	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	65	No	100% ND and RL ≤ EGLE SL
Acetophenone	98-86-2	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	6100000	No	100% ND and RL ≤ EGLE SL
Ammonia	7664-41-7	1	1	100%	µg/L	56 – 56	PCL-005-045 (10/12/2010)	150 – 150	56	MDC	270000	No	RL and MDC ≤ EGLE SL
Anthracene	120-12-7	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	43	No	100% ND and RL ≤ EGLE SL
Benzo(a)anthracene	56-55-3	1	0	0%	µg/L	N/A	N/A	0.053 – 0.053	0.053	RL	9.4	No	100% ND and RL ≤ EGLE SL
Benzo(g,h,i)perylene	191-24-2	1	0	0%	µg/L	N/A	N/A	0.053 – 0.053	0.053	RL	No SL	No	100% ND and RL ≤ EGLE SL
Cyanide	57-12-5	1	0	0%	µg/L	N/A	N/A	10 – 10	10	RL	No SL	No	100% ND and RL ≤ EGLE SL

Table 4
Occurrence, Distribution, and Selection of Constituents of Interest (Vapor Intrusion – Groundwater, Residential Exposure)
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site, Montague, Michigan

Constituents	CASRN	Total Samples	Total Detections	FOD	Units	Range of Detections	Location of Maximum Detection	Range of Reporting Limits	Screening Concentration		Screening Level [1, 2]	COPC?	Rationale
Dibenzofuran	132-64-9	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	3100	No	100% ND and RL ≤ EGLE SL
Fluorene	86-73-7	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	1700	No	100% ND and RL ≤ EGLE SL
Hexachlorobenzene	118-74-1	1	0	0%	µg/L	N/A	N/A	0.053 – 0.053	0.053	RL	3.7	No	100% ND and RL ≤ EGLE SL
Hexachlorobutadiene	87-68-3	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	12	No	100% ND and RL ≤ EGLE SL
Hexachloroethane	67-72-1	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	52	No	100% ND and RL ≤ EGLE SL
Mercury	7439-97-6	1	0	0%	µg/L	N/A	N/A	0.2 – 0.2	0.2	RL	1.6	No	100% ND and RL ≤ EGLE SL
Naphthalene	91-20-3	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	82	No	100% ND and RL ≤ EGLE SL
Nitrobenzene	98-95-3	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	750	No	100% ND and RL ≤ EGLE SL
N-Nitrosodimethylamine	62-75-9	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	No SL	No	100% ND and RL ≤ EGLE SL
Phenanthrene	85-01-8	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	150	No	100% ND and RL ≤ EGLE SL
Pyrene	129-00-0	1	0	0%	µg/L	N/A	N/A	5 – 5	5	RL	140	No	100% ND and RL ≤ EGLE SL
Thiocyanate	463-56-9	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

% = Percent
CASRN = Chemical Abstracts Service Registry Number
COPC = Constituent of Potential Concern
FOD = Frequency of Detection
MDC = Maximum Detected Concentration
ND = Non-Detect or Not Detected
RL = Reporting Limit
SL = Screening Level
µg/L = micrograms per liter
(1) Site-specific groundwater volatilization to indoor air inhalation criteria (GVIIC) were provided by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) in a correspondence dated July 31, 2020.

Table 5
Investigation VOC and SVOC List
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site
Montague, Michigan

CAS No.	Analyte	Media		
Volitale Organic Compounds (VOCs)		**Soil**	**Groundwater**	**Soil Gas**
71556	1,1,1-TRICHLOROETHANE	x	x	x
79005	1,1,2-TRICHLOROETHANE	x	x	x
76131	1,1,2-TRICHLOROTRIFLUOROETHANE (CFC-113)	x	x	x
75343	1,1-DICHLOROETHANE	x	x	x
75354	1,1-DICHLOROETHENE	x	x	x
95501	1,2-DICHLOROBENZENE	x	x	x
107062	1,2-DICHLOROETHANE	x	x	x
78875	1,2-DICHLOROPROPANE	x	x	x
541731	1,3-DICHLOROBENZENE	x	x	x
106467	1,4-DICHLOROBENZENE	x	x	x
75070	ACETALDEHYDE	x	x	x
67641	ACETONE	x	x	x
107131	ACRYLONITRILE	x	x	x
71432	BENZENE	x	x	x
56235	CARBON TETRACHLORIDE	x	x	x
108907	CHLOROBENZENE	x	x	x
75-45-6	CHLORODIFLUOROMETHANE (CFC-22)	x	x	x
67663	CHLOROFORM	x	x	x
126998	CHLOROPRENE	x	x	x
156592	CIS-1,2 DICHLOROETHENE	x	x	x
10061015	CIS-1,3-DICHLOROPROPENE	x	x	x
75718	DICHLORODIFLUOROMETHANE (CFC-12)	x	x	x
75003	ETHYL CHLORIDE	x	x	x
100414	ETHYLBENZENE	x	x	x
74873	METHYL CHLORIDE	x	x	x
80626	METHYL METHACRYLATE	x	x	x
75092	METHYLENE CHLORIDE	x	x	x
100425	STYRENE	x	x	x
127184	TETRACHLOROETHYLENE	x	x	x
109999	TETRAHYDROFURAN	x	x	x
108883	TOLUENE	x	x	x
156605	TRANS-1,2-DICHLOROETHENE	x	x	x
10061026	TRANS-1,3-DICHLOROPROPENE	x	x	x
79016	TRICHLOROETHENE	x	x	x
75694	TRICHLOROFLUOROMETHANE (CFC-11)	x	x	x
75-72-9	TRIFLUOROCHLOROFLUOROMETHANE (CFC-13)	x	x	x
75014	VINYL CHLORIDE	x	x	x
1330207	XYLENES	x	x	x

Table 5
Investigation VOC and SVOC List
Data Gaps Investigation for Vapor Intrusion to Indoor Air Pathway Evaluation
Chemours Montague Site
Montague, Michigan

CAS No.	Analyte	Media		
Semi-Volatile Organic Compounds (SVOCs)		**Soil**	**Groundwater**	**Soil Gas**
120821	1,2,4-TRICHLOROBENZENE	x	x	
120832	2,4-DICHLOROPHENOL	x	x	
105679	2,4-DIMETHYLPHENOL	x	x	
51285	2,4-DINITROPHENOL	x	x	
121142	2,4-DINITROTOLUENE	x	x	
606202	2,6-DINITROTOLUENE	x	x	
95578	2-CHLOROPHENOL	x	x	
91576	2-METHYLNAPHTHALENE	x	x	
95487	2-METHYLPHENOL (O-CRESOL)	x	x	
88755	2-NITROPHENOL	x	x	
534521	4,6-DINITRO-2-METHYLPHENOL	x	x	
59507	4-CHLORO-3-METHYLPHENOL	x	x	
106445	4-METHYLPHENOL (P-CRESOL)	x	x	
100027	4-NITROPHENOL	x	x	
98862	ACETOPHENONE	x	x	
100516	BENZYL ALCOHOL	x	x	
117817	BIS(2-ETHYLHEXYL)PHTHALATE	x	x	
132649	DIBENZOFURAN	x	x	
84662	DIETHYL PHTHALATE	x	x	
131113	DIMETHYL PHTHALATE	x	x	
84742	DI-N-BUTYL PHTHALATE	x	x	
118741	HEXACHLOROBENZENE	x	x	
87683	HEXACHLOROBUTADIENE	x	x	
67721	HEXACHLOROETHANE	x	x	
117840	N-DIOCTYL PHTHALATE	x	x	
98953	NITROBENZENE	x	x	
55185	N-NITROSODIETHYLAMINE	x	x	
62759	N-NITROSODIMETHYLAMINE	x	x	
86306	N-NITROSODIPHENYLAMINE	x	x	
108952	PHENOL	x	x	

Notes:

Ammonia was used at the facility during Neoprene production. Although likely present as a soluble salt, samples for total ammonia should be added to soil, groundwater, and vapor samples collected.

There is no information about mercury being used at the site. Likely, it would have been in laboratory equipment and fluorescent lighting bulbs, but